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## INFORMATION REPORT INFORMATION REPORT

## CENTRAL INTELLIGENCE AGENCY

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50X1-HUM

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working instructions for straight sided crank presses, types DC and DU, manufactured by VEB Werkzeugmaschinenfabrik Aschersleben.

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18 OCT 1957

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**Working Instruction  
for Straight Sided Crank Presses  
of Types DC and DU**

Page 1

**THIS WORKING INSTRUCTION  
HAS BEEN ELABORATED FOR WORKSHOP USE**

Working instructions, it is known, frequently are not obeyed in such a manner as this is necessary and, before all, practical for the operator. In many cases satisfactory results of output and work are not attained only for the reason of the operator, though adhering to the sense, not doing so to the reading of the instruction. In his opinion, it is true, he believes to be able to make proper use of the instruction after having read it once, but, nevertheless, he often causes damages by failing to consider special details.

Therefore: Do adhere strictly to our working instruction! The hints given therein are based on practical experiences, and are to assist you in your work.

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**Working Instruction  
for Straight Sided Crank Presses  
of Types DC and DU**

Page 2

**1 SUMMARY**

**Straight Sided Crank Press D**

(1) Summary

(2) Transport  
Assembly  
Attendance

(3) Electric  
Parts

(4) Lubrication

(5) Operation

(6) Schedules

(7) Gear Plan  
Spare Parts

(8) Tools  
Accessories  
Additional  
Attachments

Machine symbol  
and design .....

Additional attachments: .....

.....

.....

Order No.: ..... Dated: .....

Fabr. No.: ..... Produced in .....

(9) Terms of  
Acceptance

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**Working Instruction  
for the Straight Sided Crank Press  
of Type DU 160/630**

Page 3

**MAIN DIMENSIONS****Main Press**

Max. pressure 17 mm above lower position of crank	160000 kgs
Height of stroke .....	250 mm
Ram adjustment .....	110 mm
Max. clearance between table and ram .....	800 mm
Min. clearance between table and ram .....	440 mm
Inside width between the stands .....	630 mm
Table area .....	630 x 1060 mm
Opening in the table .....	315 x 530 mm
Ram area .....	450 x 860 mm
Thickness of the chucking plate .....	110 mm
Driving motor .....	18 KW, n = 1500 rpm
Speed of the flywheel shaft .....	630 rpm
Space required .....	abt. 1600 x 1800 mm
Net weight (with side press) .....	about 12000 kgs
Gross weight (with side press), seaworthy packed .....	about 13800 kgs
Loading space required, chests: length	about 5300 mm
width	about 2300 mm
height	about 2100 mm

**Side Press**

Maximum pressure .....	50000 kgs
Overhang .....	225 mm
Height of stroke .....	60 mm
Ram adjustment .....	75 mm
Maximum clearance between table and ram .....	355 mm
Minimum clearance between table and ram .....	220 mm
Table area .....	400 x 630 mm
Opening in the table .....	140 x 225 mm
Ram area .....	315 x 450 mm

**Total Wear of the Friction Linings**

Coupling side	14 mm
Brake side	10 mm

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**Working Instruction  
for the Straight Sided Crank Press  
of Type DU 250/800**

Page 3

**MAIN DIMENSIONS****Main Press**

Max. pressure 21 mm above lower position of crank	250000 kgs
Height of stroke .....	315 mm
Ram adjustment .....	130 mm
Maximum clearance between table and ram .....	1000 mm
Minimum clearance between table and ram .....	555 mm
Inside width between the stands .....	810 mm
Table area .....	800 x 1180 mm
Opening in the table .....	400 x 600 mm
Ram area .....	620 x 960 mm
Thickness of the chucking plate .....	110 mm
Driving motor .....	18 KW, n = 1430 rpm
Speed of the flywheel shaft .....	630 rpm
Spaces required .....	abt. 2100 x 2200 mm
Net weight .....	about 1900 kgs
Gross weight (with side press, seaworthy packed) .....	about 2100 kgs
Leading space required, chests: length: about	6000 mm
width: about	2700 mm
height: about	2600 mm

**Side Press**

Maximum pressure .....	80000 kgs
Overhang .....	280 mm
Height of stroke .....	80 mm
Ram adjustment .....	85 mm
Maximum clearance between table and ram .....	400 mm
Minimum clearance between table and ram .....	235 mm
Table area .....	450 x 710 mm
Opening in the table .....	180 x 280 mm
Ram area .....	355 x 500 mm

**Total Wear of the Friction Linings**

Coupling side	15 mm
Brake side	11 mm

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**Working Instruction  
for Straight Sided Crank Presses  
of Type DC 250/800**

Page 3

**MAIN DIMENSIONS****Press**

Max. pressure 21 mm above lowest crank position	250000 kgs
Height of stroke .....	315 mm
Ram adjustment .....	130 mm
Maximum clearance between table and ram .....	1000 mm
Minimum clearance between table and ram .....	555 mm
Inside width between the stands .....	810 mm
Table area .....	800 x 1180 mm
Opening in the table .....	400 x 600 mm
Ram area .....	620 x 960 mm
Thickness of the chucking plate .....	130 mm
Driving motor .....	28 KW, n = 1430 rpm
Speed of the flywheel shaft .....	630 rpm
Space required .....	abt. 1800 x 1900 mm
Net weight .....	about 17500 kgs
Gross weight (seaworthy packed) .....	about 19500 kgs
Loading space required, chests: length: about	6200 mm
width: about	2400 mm
height: about	2300 mm

**Total Wear of the Friction Linings**

Coupling side	15 mm
Brake side	11 mm

**Stroke Numbers of the Machine**

- |  |           |
|--|-----------|
| 1) Maximum stroke number of the continuously running machine in idle run   | = 18 p.m. |
| 2) Useful stroke number of the continuously running machine at an output of 4000 mkg per stroke                                | = 16 p.m. |
| 3) Maximum stroke number with single stroke adjustment during the running-in time of the machine (up to 50000 motions)         | = 8 p.m.  |
| 4) Maximum stroke number with single stroke adjustment after the running-in time of the machine (after 50000 motions)          | = 10 p.m. |
| 5) Useful stroke number of the machine with single stroke adjustment and the permissible maximum output of 6700 mkg per stroke | = 8 p.m.  |

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**Working Instruction  
for Straight Sided Crank Presses  
of Type DC 315/800**

Page 3

**MAIN DIMENSIONS****Press**

Max. pressure 21 mms above lowest crank position	315000 kgs
Height of stroke .....	315 mms
Ram adjustment .....	140 mms
Maximum clearance between table and ram .....	1000 mms
Minimum clearance between table and ram .....	545 mms
Inside width between the stands .....	800 mms
Table area .....	800 x 1250 mms
Opening in the table .....	400 x 630 mms
Ram area .....	620 x 1000 mms
Thickness of the chucking plate .....	140 mms
Driving motor .....	32 KW, n = 1390 rpm
Speed of the flywheel shaft .....	560 rpm
Space required .....	abt. 1900 x 2200 mms
Net weight .....	about 25000 kgs
Gross weight (seaworthy packed) .....	about 27200 kgs
Leading space required, chests: length: about	6400 mms
width: about	2700 mms
height: about	2400 mms

**Total Wear of the Friction Linings**

Coupling side	16 mms
Brake side	10 mms

**Stroke Numbers of the Machine**

- 1) Maximum stroke number of the continuously running machine in idle run = 18 p.m.
- 2) Useful stroke number of the continuously running machine at an output of 5000 mkg per stroke = 16 p.m.
- 3) Maximum stroke number with single stroke adjustment during the running-in time of the machine (up to 50000 motions) = 6 p.m.
- 4) Maximum stroke number with single stroke adjustment after the running-in time of the machine (after 50000 motions) = 8 p.m.
- 5) Useful stroke number of the machine with single stroke adjustment an permissible maximum output of 9000 mkg per stroke = 8 p.m.

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**Working Instruction  
for Straight Sided Crank Presses  
of Type DV 315/800**

Page 3

**MAIN DIMENSIONS****Main Press**

Max. pressure 21 mm above lowest crank position	315000 kgs
Height of stroke .....	315 mm
Ram adjustment .....	140 mm
Maximum clearance between table and ram .....	1000 mm
Minimum clearance between table and ram .....	545 mm
Inside width between the stands .....	800 mm
Table area .....	800 x 1250 mm
Opening in the table .....	400 x 630 mm
Ram area .....	620 x 1000 mm
Thickness of the chucking plate .....	140 mm
Driving motor .....	32 kW, n = 1390 rpm
Speed of the flywheel shaft .....	560 rpm
Space required .....	abt. 2150 x 2300 mm
Net weight (with side press) .....	about 26500 kgs
Gross weight (with side press, seaworthy packed) .....	about 28700 kgs
Leading space required, chests: length: about	6600 mm
width: about	2800 mm
height: about	2700 mm

**Side Press**

Maximum pressure .....	100000 kgs
Overhang .....	315 mm
Height of stroke .....	80 mm
Ram adjustment .....	90 mm
Maximum clearance between table and ram .....	320 mm
Minimum clearance between table and ram .....	150 mm
Table area .....	500 x 750 mm
Opening in the table .....	200 x 315 mm
Ram area .....	375 x 530 mm

**Total Wear of the Friction Linings**

Coupling side	16 mm
Brake side	10 mm

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**Working Instruction  
for Straight Sided Crank Presses  
of Type DC 160/630**

Page 3

**MAIN DIMENSIONS****Press**

Max. pressure 17 mm above lowest crank position ..	160000 kgs
Height of stroke .....	250 mm
Ram adjustment .....	110 mm
Maximum clearance between table and ram .....	800 mm
Minimum clearance between table and ram .....	440 mm
Inside width between the stands .....	630 mm
Table area .....	630 x 1060 mm
Opening in the table .....	315 x 530 mm
Ram area .....	450 x 860 mm
Thickness of the chucking plate .....	110 mm
Driving motor .....	18 KW, n = 1500 rpm
Speed of the flywheel shaft .....	630 rpm
Space required .....	abt. 1600 x 1700 mm
Net weight .....	about 11000 kgs
Gross weight (seaworthy packed) .....	about 12800 kgs
Leading space required, chests: length: about	5300 mm
width: about	2250 mm
height: about	2100 mm

**Total Wear of the Friction Linings**

Coupling side	14 mm
Brake side	10 mm

**Stroke Numbers of the Machine**

- |  |           |
|--|-----------|
| 1) Maximum stroke number of the continuously running machine in idle run   | = 22 p.m. |
| 2) Useful stroke number of the continuously running machine at an output of 3000 mkg per stroke                            | = 20 p.m. |
| 3) Maximum stroke number with single stroke adjustment during the running-in time of the machine (up to 50000 motions)     | = 9 p.m.  |
| 4) Maximum stroke number with single stroke adjustment after the running-in time of the machine (after 50000 motions)      | = 11 p.m. |
| 5) Useful stroke number of the machine with single stroke adjustment and permissible maximum output of 5000 mkg per stroke | = 9 p.m.  |

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**Working Instruction  
for Straight Sided Crank Presses  
of Type DU 315/800**

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**MAIN DIMENSIONS****Stroke Numbers of the Machine**

- |  |   |         |
|--|---|---------|
| 1) Maximum stroke number of the continuously running machine in idle run   | = | 18 p.m. |
| 2) Useful stroke number of the continuously running machine at an output of 5000 mkg per stroke                            | = | 16 p.m. |
| 3) Maximum stroke number with single stroke adjustment during the running-in time of the machine (up to 50000 motions)     | = | 6 p.m.  |
| 4) Maximum stroke number with single stroke adjustment after the running-in time of the machine (after 50000 motions)      | = | 8 p.m.  |
| 5) Useful stroke number of the machine with single stroke adjustment and permissible maximum output of 9000 mkg per stroke | = | 8 p.m.  |

The progressing development of our machines induces their continuous modification. It may be, for this reason, that in a given case the working instruction does not agree in any details with the machine supplied.

When ordering spare parts, therefore, always the design and the number of the machine should be stated.

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**Working Instruction  
for Straight Sided Crank Presses  
of Type DC 160/630**

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**MAIN DIMENSIONS****Air Cushion**

Theoretical power with 6 atmospheres .....	20000 kgs
Stroke .....	125 mm
Pressing face .....	$2 \times 1900 = 3800 \text{ cm}^2$
Working volume .....	48 ltrs
Capacity of the air vessel .....	400 ltrs
Type of compressor .....	K1 12/A/100

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When ordering spare parts, therefore, always the design and the number of the machine should be stated.

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**Working Instruction  
for Straight Sided Crank Presses  
of Type DC 250/800  
and DC 315/800**

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**MAIN DIMENSIONS****Air Casheen**

Theoretical power with 6 atmospheres .....	32000 kgs
Stroke .....	160 mmg
Pressing face .....	4 x 1900 = 7600 cm <sup>2</sup>
Working volume .....	122 litres
Capacity of the air vessel .....	
Type of compressor .....	

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**Working Instruction  
for Straight Sided Crank Presses  
of Types DC and DU**

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**2 TRANSPORT . ASSEMBLY . ATTENDANCE****2.1 TRANSPORT**

Ascertain upon arrival of the machine whether it has been damaged during transportation. Transport it as close as possible to its place of location. Prior to removing the crate, check carefully once more for transport damages. For crane transport suspend the parts according to Fig.1. For this purpose ropes are more husbanding and dependable than chains. When carrying out the transport without chains use as small rollers as possible, taking special care that the machine does not tilt which may easily happen, due to the elevated position of the center of gravity.

**2.2 ASSEMBLY**

Every machine which is expected to work exactly and to have a long life calls for a reliable standing. The required special dimensions can be gathered from the foundation plan. The foundation depth given therein is a minimum dimension depending on the ground conditions encountered on site. The foundation must be hardened before the machine is erected. Remove, on the place of installation, anticorrosive grease and dust from the machine and erect it subsequently according to Fig.2. In case of delivery with detached drawing cushion this should be inserted into the foundation pit prior to the erection of the machine, and fastened later-on to the table of the erected machine. Align the machine by means of a spirit level, tamp it and cast it in. When tamping pay attention to no cavities arising underneath the bearing surfaces. Tighten the foundation screws only after the concrete has become perfectly hard.

In case a dismantled machine is supplied, as to the assembly the following important hints should be adhered to:

(See drawing: Assembly of straight sided presses)

Prior to assembly remove anticorrosive grease and dust from all parts of the machine.

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**Working Instruction  
for Straight Sided Crank Presses  
of Type BU 160/630**

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**MAIN DIMENSIONS****Stroke Numbers of the Machine**

- 1) Maximum stroke number of the continuously running machine in idle run = 22 p.m.
- 2) Useful stroke number of the continuously running machine at an output of 3000 mkg per stroke = 20 p.m.
- 3) Maximum stroke number with single stroke adjustment during the running-in time of the machine (up to 50000 motions) = 9 p.m.
- 4) Maximum stroke number with single stroke adjustment after the running-in time of the machine (after 50000 motions) = 11 p.m.
- 5) Useful stroke number of the machine with single stroke adjustment and permissible maximum output of 5000 mkg per stroke = 9 p.m.

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When ordering spare parts, therefore, always the design and the number of the machine should be stated.

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**Working Instruction  
for Straight Sided Crank Presses  
of Type DU 250/800**

Page 4

**MAIN DIMENSIONS****Stroke Numbers of the Machine**

- |  |           |
|--|-----------|
| 1) Maximum stroke number of the continuously running machine in idle run   | = 18 p.m. |
| 2) Useful stroke number of the continuously running machine at an output of 4000 mkg per stroke                            | = 16 p.m. |
| 3) Maximum stroke number with single stroke adjustment during the running-in time of the machine (up to 50000 motions)     | = 8 p.m.  |
| 4) Maximum stroke number with single stroke adjustment after the running-in time of the machine (after 50000 motions)      | = 10 p.m. |
| 5) Useful stroke number of the machine with single stroke adjustment and permissible maximum output of 6700 mkg per stroke | = 8 p.m.  |

The progressing development of our machines induces their continuous modification. It may be, for this reason, that in a given case the working instruction does not agree in any details with the machine supplied.

When ordering spare parts, therefore, always the design and the number of the machine should be stated.

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**Working Instruction  
for Straight Sided Crank Presses  
of Types DC and DU**

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**2 TRANSPORT . ASSEMBLY . ATTENDANCE**

Operating sides of table, head piece, ram and stand are marked with "B".

Align the machine table on the foundation by means of a spirit level. The drawing cushion, if supplied, should be inserted first into the foundation pit and fastened afterwards to the table. Cast in the table after having tamped it, and tighten the foundation screws after the concrete has become perfectly hard.

Figure 1: If the table is placed on the foundation according to the facing drawing the anchors should be installed and shrunk in adherence to the indicated sequence.

Figure 2: Insert the two left (or right) anchors into the table. Unscrew the lower anchor nut "Mu" until the point "a" is reached. Secure the anchor nut against displacement by tightening the screw "S". Lower the anchor down to the bottom of the foundation pit. Set up the left and right side stand respectively with unchanged guide rails and arrest them by means of the bolts "B" and the wedge driven into the table; bolt the side stands with the table.

Figure 3: Insert the ram fitted with press rods (lower half) and ejector up to the guide rails of the upright side stand. Underpin the ram according to dimensions "Ram down" and "Adjustment up" (see drawing 2 DU 2105) and place it on the table. Insert the two remaining anchors, unscrew the lower nut "Mu" to the extent "a" and lower the anchors to the bottom of the foundation pit. For setting up the second side stand, the two long ejector rails must be pushed back laterally till they are not any longer in the way of the side stand.

For this purpose firstly the two transverse ejector beams must be pulled out. The displacement of the rails is required only at single-acting straight sided crank presses (two-point system - type Df).

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Working Instruction  
for Straight Sided Crank Presses  
of Types DC and DU

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2 TRANSPORT . ASSEMBLY . ATTENDANCE

Figure 4: Set up the head piece with mounted internal parts, arrest it by the bolts "B1", and attach the upper anchor nuts "Mo".

Figures 5 and 6: Suspend the anchor, move it upward through the head piece, and tighten the nuts "Mo" as much as possible.

Measure and record exactly the dimension "b" of each anchor.

Figure 5: Unscrew the nuts "Mo", leave them on the head piece, and set up again the anchor on the bottom of the foundation pit.

Figures 5, 6 and 7: Heat each anchor individually in sequence 1-3-2-4 or, if possible, two anchors simultaneously in sequence 1+3-2+4 in length "c" till length "d" has expanded to length "e". Move the heated anchors through the head piece upward, and unscrew the nuts "mo" up to the extent "b" plus "x". Allowance +0.1 mm. As to the dimensions "a-c-d-e" and "x" see the schedule on the sketch.

Upon finished drawing-in and shrinking of the anchors the ram is connected with the crank. The crank is turned to its lowest position and the ram with screwed-in press rod hung on through the inner space of the head piece, the bearing of the press rod is approached to the crank and the press rod cover attached. Wedge on the toothed gear wheel, set the complete flywheel shaft with laid-on V-belts on its bearings, and attach the bearing covers. All parts such as driving motor, control valve etc. now are mounted on the head piece.

Into the shrunk-in press body now the electric lines may be inserted according to the cable diagram enclosed.

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**Working Instruction  
for Straight Sided Crank Presses  
of Types DC and DU**

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**2 TRANSPORT . ASSEMBLY . ATTENDANCE**

Connect the compressed air pipings and greasing tubes, the latter according to their numbering, and connect the former to the main pipings. Now the machine should be turned by hand, and that by means of a spike inserted in one of the holes of the flywheel rim after the coupling has been engaged. In course of this procedure check, before all, the guide of the ram and the parallelity between table and ram face.

Above the machine a lifting device for lifting the complete flywheel shaft should be provided.

**2.3 CLEANING**

Cleanliness and careful attendance are considerable factors for prolonging the life of the machine. Coarse impurities, therefore, should be removed at the least once a week. Every 4 weeks the machine should be carefully cleaned.

**2.4 ATTENDANCE**

The regularity according to which the machine is cleaned, lubricated, and checked is decisive for its life. The instructions necessary for lubrication may be gathered from drawing . indicating also details concerning kind and time of lubrication. A double of this instruction should be handed to the operating staff. All parts of the machine calling for a continuous supply of lubricant are lubricated through a central greasing equipment attendance to which is specified in a special instruction. The supply to the individual greasing points has been adjusted by us to the maximum conveying capacity and has to be readjusted, after putting the machine into service, under most careful observation of the individual greasing points.

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**Working Instruction  
for Straight Sided Crank Presses  
of Types DO and DU**

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**2 TRANSPORT . ATTENDANCE . ASSEMBLY**

When renewing greasing tubes the inside of the new tubes must be carefully cleaned and filled with grease prior to the start of the machine.

The worm drive for the ram adjustment runs in an oil bath. The hollow space in the ram provided for this should be filled with oil level of which can be checked through an oil level eye. For replacing the oil two drain screws are provided. Prior to adjusting the ram lubricate the pressure spindle thread and the draw-back ring through the attached lubrication nipple.

After 3000 working hours the antifriction bearings should be carefully washed and refilled with suitable grease. Apart from this they should be listened to periodically and checked for their smooth run.

**Replacement of the V-belts**

Detach the bearing cover screws, the compressed air pipes, and the fastening screws of the air cylinder. Subsequently the flywheel shaft is lifted, and the V-belts are replaced by new ones.

**Readjustment of the Guide Rails**

Pay attention to the counter-pressure screws being tightened firmly after the guide rails are adjusted.

**Play between Pressure Spindle and Pressure Pan**

The cover above the draw-back ring should be adjusted in such a way that there is a close guide between the pressure spindle ball and the pressure pan. Any play probably arising in course of time should be removed by remachining the balancing disks.

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Working Instruction  
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## 2. TRANSPORT . ASSEMBLY . ATTENDANCE

### 2.5 PUTTING INTO SERVICE

Prior to starting the machine one should become familiar with all operating elements and their action, and that most perfectly. Check the proper connection of the compressed air and the electric line. The manometer in the coupling compressed air line has to indicate  $4 \text{ kg/cm}^2$  s.a., and the appropriate safety valve should respond at  $4.5 \text{ kg/cm}^2$  s.a.

The central greasing device as well as the greasing pipes should be filled with grease. All other greasing points of the machine, which are marked with red colour, should amply be lubricated.

Test the V-belts for proper tension and satisfactory alignment.

It must be possible to turn the flywheel by hand if the coupling is disengaged. Start the motor and check the sense of rotation and the speed of the flywheel for their accordance to the indications engraved on the flywheel rim; test the ram adjusting motor.

As to testing the engagement see Drawings 3E 2397-A, 3E 2397-A1-1, and 3E 2397-A2-2

2.5. 1. Connect the control current switch "Coupling" installed in the switch cabinet.

2.5. 2. Adjust the selector switch to "Single Stroke": Press the push buttons "Coupling on" simultaneously till the ram has reached its lowest position, then stop pressing. The ram has to run upward and to stop in its upper position of stroke. If the push buttons "Coupling on" are not released during the upward stroke of the ram in spite of this it will stop in its upper position (single stroke safety device).

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**Working Instruction  
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**2 TRANSPORT . ASSEMBLY . ATTENDANCE**

Press the push buttons "Coupling on" simultaneously and release them during the downward stroke of the ram. The ram has to stop forthwith (safety stop).

2.5. 3. Adjust the selector switch to "Continuous Stroke":  
Press ~~sharply~~ and simultaneously the push buttons "Coupling on". Now the ram moves continuously. Upon pressing the "Stop"-button the ram has to stop forthwith. In case these connections can be carried out the engagement is in order.

After all tests are finished the machine is started for trial run in engaged condition during which special care is taken of the properly functioning central lubrication.

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**3 ELECTRIC PARTS****3.1 ATTENDANCE TO THE ELECTRIC INSTALLATION**

Ascertain prior to putting the machine into service:

3.1. 1. Is the available working voltage in accordance to the data indicated on the voltage plate attached to the machine?

3.1. 2. Is the sense of rotation of the motors correct?

**3.2 ELECTRIC SPARE PARTS**

When ordering them state the type and fabr.-No. of the respective device, and the order-No. of the machine.

**3.3 CLEANING**

Check motors and switches every six months. If necessary, fill up ball bearing grease, and remove dust. Such work as well as the remachining of burnt parts should be carried out by an expert only. The parts are built-in and not accessible from the outside. Do not use any motor or motorcar fuel for cleaning purposes but preferably soft, non-fibrous cloths (no cleaning wool) which have been dipped into purified benzene.

**3.4 SPECIAL CAUSES OF DEFECTS**

Motors which have got wet should be examined by an expert and dried prior to their putting into service. Strange noises in the running motor hint at impurities or failing lubrication. Stop the motor at once and investigate. Dismantle and renew switching contacts which are burnt out to such an extent that after switching they do not spring more than by about half a millimeter.

As to the electric connection the following else should be implicitly considered:

VDE-rules and special local regulations should be adhered to most exactly.

The ground terminal of the machine should be connected carefully with the neutral and the earth wire respectively.

The machine is delivered completely wired; the wiring diagrams 3E 2397-A, 3E 2397-A1-1, and 3E 2397-A2-2 show the electric connections within the machine.

Furthermore, the following sources of defects may arise:

**3.4. 1. Failure of Control**

When operating the push buttons "Coupling on" the latter does not respond.

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**3 ELECTRIC PARTS**

- Causes:**
1. Compressed air supply failing or working with insufficient pressure (look at the manometer).
  2. The limit switch for the single stroke and catching safety device adheres.
  3. The magnet to the control valve does not attract.

**3.4. 1.1 The machine stops during the stroke**

- Causes:**
1. Interruption of compressed air supply to the coupling or insufficient pressure, evtl. due to a burst pipe (look at the manometer),
  2. Slipping clutch (substantially exceeded torque or oiled friction linings).
  3. The limit switch to the single stroke and catching safety device adheres (possible with selector switch position "Single Stroke" only).

Press immediately the, resp. a "Stop"-button and disconnect the driving motor.

**3.4. 1.2 The running machine does not respond to the operation of the "Stop"-button, or executes several strokes though the selector switch is adjusted to "SINGLE STROKE".**

- Causes:**
1. The piston of the control valve is adhering.
  2. The electric control contactors are adhering.

The driving motor must be stopped forthwith.

**3.5 ATTENDANCE TO THE ELECTRIC INSTALLATION**

After 3000 working hours the antifriction bearings should be washed carefully and refilled with suitable grease. The push button "Coupling on" and "Stop" as well as the control sets should be tested for their satisfactory condition.

The insulating value of the stator winding should be tested after 1500 working hours. It must not be less than 1000 Ohms per 1 V working voltage.

The driving motor should be blown from time to time with dry air and checked for its smooth run in its position.

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**3 ELECTRIC PARTS**

The control magnet must be cleaned at the least once a week. Apart from this, it should be checked for satisfactory guide and perfect attraction. An imperfect attraction may cause the destruction of the magnet winding already after a short working time.

The push buttons "Coupling on" and "Stop", the limit switches and other control devices should be tested once a week for their proper functioning.

The contacts should be inspected once a week, upon short circuit immediately, and, if necessary, remachined and renewed respectively.

The control voltage is 220 volts. With a working voltage of 380 volts the control voltage is taken from one phase of the network and the neutral conductor.

After 3000 working hours all lines should be tested at the least once, and upon short circuits immediately for their insulating value which, if possible, is not to be less than 1000 Ohms per 1 V working and control voltage.

All terminal nuts and screws should be checked periodically and retightened, if necessary.

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**3 ELECTRIC PARTS****3.6 List of Electric Devices**

<u>Pos.:</u>	<u>Designation:</u>	<u>Type:</u>	<u>Supplier:</u>
<b>a) <u>Main Drive</u></b>			
1	Three-phase squirrel-cage motor B3, 18.5 KW, 220/380 V, 1435 rpm, 66/38 Amp.	KD 62/4	Sachsenwerk
1	Air contactor with motor protection without covering, control v. 220 V, working v. 380 V, 40 to 64 Amp.	LFB 75	Treptow
1	Double push button insertion	K 205 IIB	IKA Rochlitz
3	1-pole fuse elements EZ, 100 Amp.	Single elements front connection	
3	Time-delayed cartridges 100 Amp.		Prüfger.Berlin
1	Signal lamp, 1-pole, bisectioned		Prüfger.Berl'
1	Circuit-breaker, 250 V, 6 to 10 Amp.	SB1/1 Pl.No.281910	IKA Annaberg
<b>b) <u>Control of Coupling</u></b>			
1	Three-phase brake lifting magnet, stroke 2.5 cms., 220/380 V, 1000 connections per hour	DB 230 capacity 9 kgs duty cycle 100 %	Naumann
2	Air contactors without motor protection, 220 V, 15 Amp.	K 917 III-2	IKA Oppach
3	1-pole fuse elements EZ 25 Amp.	Single elements front connection	
3	Time-delayed cartridges, 15 Amp		
1	Selector switch: Adjustment, Single stroke, continuous stroke, Off	ETO 16627 Pl.No.: 281910	AEG Annaberg
1	Limit switch with 2 circuits, with roller	4E 5752 (K 2804R)	IKA Rochlitz
3	Single push Button insertions with DR 200 with DU 160	Pl.No.269200 1 x K 205 I 2 x K 205 I em	Apparatebau Treptow
1	Circuit-breaker 250 V, 6 to 10 Amp.	SB 1/1 Pl.No.281910	IKA Annaberg
1	Signal lamp, complete, bisectioned		Prüfgeräte Berlin

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**3 ELECTRIC PARTS****3.6 Parts of Electric Devices**

<b>Pcs.:</b>	<b>Designation:</b>	<b>Type:</b>	<b>Supplier:</b>
<b>a) Main Drive</b>			
1	Slipring motor B3; 32 KW; 43.5 HP; 220/380 V; 1390 rpm; 106/61 Amp.	D 76-4	Sachsenwerk
1	Motor contactor without casing, control v. 220 V, working v. 380 V.	100 Rheostat	Apparatebau Treptow
1	Bimetal relay, 64-100 Amp.	U III	Apparatebau Treptow
1	Double push button insertion "On" - "Off"	K 205 IIe	IKA Oppach
1	Signal lamp, complete, 220 V, bisectioned	200 Amp.	
3	Time-delayed fuse cartridges	160 Amp.	
3	1-pole fuse elements, 200 Amp, rear connection	Single elements for switchboard mounting	
1	Surface circuit-breaker, brown insulating material	250 V 6 - 10 Amp.	
1	Protective motor switch without casing, control voltage 220 V, working voltage 380 V	EMF sbr.100 64 - 100 A	A I
<b>b) Drive of Ram Adjustment</b>			
1	Three-phase squirrel-cage motor B5; 2.5 KW; 3.4 HP; 220/380 V; 1390 rpm; 10/5.8 Amp.	D 35 - 4	Sachsenwerk
1	Remote protective motor reversing switch without covering, control voltage 220 V, working v. 380 V	K 817 III-2a 6 - 8 Amp.	IKA Oppach
3	1-pole fuse <del>cartridges</del> <i>elements</i> , 25 Amp.	Single elements, rear connection	
3	Time-delayed cartridges	15 Amp.	
1	Double push button insertion Up - Down	K 205 IIem	IKA Oppach
2	Limit switches with pin	U 1	Bernstein
1	Circuit-breaker, brown, surface mounting, 250 V, 6-10 Amp.		
1	Signal lamp, complete, 220 volts, bisectioned	IPA - K 514	Koch, Ilmenau

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**3 ELECTRIC PARTS****3.6 Parts of Electric Devices**

<b>Pcs.:</b>	<b>Designation:</b>	<b>Type:</b>	<b>Supplier:</b>
<b>a) Main Drive</b>			
1	Three-phase squirrel-cage motor B3, 28 KW; 33 HP; 220/380 V; 1145 rpm; 97/56 Amp.	D 10/4	Wernigerode
1	Motor contactor without covering, control v. 220 V, working v. 380 V	L 100	Rheostat
1	Bimetal relay, 40 to 64 Amp.	U III	App. Treptow
1	Double push button insertion	K 205 IIc	IKA Oppach
3	1-pole fuse elements, 100 Amp.		
3	Time-delayed cartridges, 125 Amp.		
1	Buried circuit-breaker, brown insulating material	250 V 6 to 10 Amp.	
1	Signal lamp, complete, with built-in bulb of 220 volts	bisectioned	Koch, Ilmenau
<b>b) Control of Coupling</b>			
1	Brake lifting magnet, stroke 2.5 cms., attraction capacity 9 kgs., 220/380 V, 1000 connect- ions per hour, duty cycle 100 %	DB 230	Neumann
2	Air contactors without motor protection, 220 V, 15 Amp.	K 917 III-2	SSW Oppach
3	1-pole fuse elements, 25 Amp.		
3	Time-delayed cartridges, 15 Amp.		
1	Selector switch installation for Adjustment, Single stroke, Continuous stroke	WN 1075	AEG Annaberg
1	Limit switch with 2 circuits, with roller	4 E 5752	IKA Oppach
3	Single push button insertions	K 1	W. u. Z.
1	Signal lamp, complete with built-in bulb of 220 volts	bisectioned	Koch, Ilmenau

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**3 ELECTRIC PARTS****3.6 List of Electric Devices**

<b>Pos.:</b>	<b>Designation:</b>	<b>Type:</b>	<b>Supplier:</b>
<u>Additional sets for two-man control</u>			
1	Surface circuit breaker 250 V, brown insulating material, for one-man operation	250 V, 6 - 10 Amp.	
3	Single push button insertions	Pl.No.269200	App. Treptow
1	Three-phase squirrel-cage motor B5; 1.8 KW; 2.5 HP; 220/380 V; 1390 rpm; 7.7/4.4 Amp.	M 65262	Sachsenwerk R.
1	Reversing contactor with motor contactor, control V. 220 V, working v. 380 V, 3.5 - 4.6 Amp.	K 817 III-2a	IKA Oppach
1	Limit switch according to DL 1237	K 2804	
3	1-pole fuse elements, 25 Amp.		
3	Time-delayed cartridges, 15 Amp.		
1	Circuit breaker	SB 1/1 Pl.No.281910	IKA Annaberg
1	Double push button "On - On"	K 205 II em	IKA Rochlitz

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**3 ELECTRIC PARTS****3.6 Parts of Electric Devices**

<b>Pcs.:</b>	<b>Designation:</b>	<b>Type:</b>	<b>Supplier:</b>
1	Buried circuit breaker, brown insulating material	250 V, 6-10 Amp.	
	<u>c) Ram Adjustment Drive</u>		
1	Three-phase squirrel-cage motor B5; 1.8 KW; 220/380 V; 7.6/4.4 Amp. 1390 rpm	M 65262	Sachsenwerk
1	Remote protective motor reversing switch without covering, control voltage 220 V, working voltage 380 V, 15 Amp.	K 817 III-2a 3.5 - 4.6 A	IKA Oppach
1	Double push button insertion Up - Down	K 205 II em	IKA Oppach
1	Special limit switch	3 DL 1237	
3	1-pole fuse elements, 25 Amp.	15 Amp.	
3	Time-delayed cartridges		
1	Buried switch brown insulating material	250 V 6-10 Amp.	
1	Signal lamp with glim lamp, bisectioned		Koch, Ilmenau
	<u>d) Miscellaneous</u>		
1	Lever switch, 100 Amp.	ARH 100	IKA Grimma
1	1-pole fuse element	25 Amp.	
1	Cartridge	6 Amp.	
1	Signal lamp with glim lamp		Koch, Ilmenau

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**3 ELECTRIC PARTS****3.6 Parts of Electric Devices**

<b>Pcs.:</b>	<b>Designation:</b>	<b>Type:</b>	<b>Supplier:</b>
<b>c) Control of Coupling</b>			
2	Air contactors without motor protection, control v. 220 V, working v. 380 V, without covering	K 917 III-2	IKA Oppach
1	Three-phase brake lifting magnet, stroke 2.5 cms., attraction cap. 20 kg; 1000 connections per hour; duty cycle 100 %	DB 460	Naumann, Nieder
3	1-pole fuse elements, 25 Amp.	Single elements, rear connection	
3	Time-delayed cartridges	15 Amp.	
1	Limit switch with 2 circuits, with roller	--	IKA Oppach
1	Surface circuit breaker, brown insulating material	250 V, 6-10 Amp.	
1	Signal lamp, complete, 220 V, bisectioned	IFA - K 514	Koch
1	Selector switch installation for single stroke, continuous stroke, adjustment	WN 1075	IKA Annaberg
3	Single push button insertions	K 1	Weyer

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**4 LUBRICATION**

The life of the machine depends to the greatest part on its lubrication. Therefore, adhere strictly to the lubrication rules, lubrication instruction, and lubrication plan (drawing                      ). Keep the lubricators closed. Lubricants from unboiled containers must not be used any longer - one single foreign body contained therein may destroy the bearing. Use filtering screens when filling in the oil, also oil cans should be provided with screens. Check continuously the oil level and keep it on correct level.

Drain the oil in service-hot condition only, flush with benzole; petroleum and benzene are not recommendable. Clean the greasing points only with non-fibrous cloths, do not use any cleaning wool.

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**5 OPERATION . CONSTRUCTION**

An exact knowledge of construction and working manner of the machine is necessary for a correct and husbanding operation.

Prior to putting the machine into service study the following description in any case.

**5.1 CONSTRUCTION OF THE MACHINE**

The general construction of the press may be gathered from the enclosed assembly drawing.

The body consists of the table, the two side stands, and the head piece. These parts are made in welded construction and fastened rigidly to each other by means of four hot-shrunk anchors.

The drive is effected by an electric motor arranged on an adjustable bracket through V-belts driving the flywheel running in antifriction bearings. From the flywheel shaft the movement is transmitted through gearings to the press rod and the ram. As to the multiple disk coupling and the brake a special description is enclosed.

The ram slides between readjustable guide rails. The cover above the draw-back ring in the ram is adjusted, by means of balancing disks, in such a way that a closing guide of the pressure spindle ball and the pressure pan is attained.

The vertical adjustment of the ram is effected through an oil-immersed running worm gear by a reversible electric motor. The extent of adjustment, which must not be exceeded, is transmitted mechanically to the graduation arranged at the front side of the ram. As soon as, with motor drive, the upper and the lower limit position of adjustment respectively is reached the motor is stopped by responding limit switches.

The ram is balanced by means of counter-weights provided in the crank wheels.

If the ejector is not to be used the pressure screws should be put back to such an extent that the ejector is put out of operation; a wrong adjustment of the pressure screws entails damages to the machine.

**5.2 OPERATION OF THE MACHINE**

The driving motor is a squirrel-cage motor of design B3. Its starting time with idle-running flywheel mass amounts to about 15 to 30 seconds. The speed drop per working stroke is not to exceed 25 per cent. of the nominal speed. The protective motor switch takes care

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**5 OPERATION . CONSTRUCTION**

of overload protection, and a three-pole fuse protects the motor from short-circuits.

**5.2 1. Start of the Driving Motor**

1. Close the control current switch "Main Motor" in the switch cabinet. (On the main operating desk the corresponding signal lamp is lighting.)
2. Press the push button "On" arranged on the main operating desk.

**2. Stop of the Driving Motor**

1. Press the push button "Off" arranged on the main operating desk.
2. Disconnect the control current switch in the switch cabinet (disconnection required at the end of work, not during short time working pauses.).

Prior to finished high-run the machine should not be stopped unless upon danger.

**5.2 3. Operation of the Ram Adjusting Motor**

1. Close the control current switch "Ram Motor" in the switch cabinet. (On the main operating desk the corresponding signal lamp is lighting.)
2. Press the push button "Up" or "Down" arranged on the main operating desk.
3. Disconnect the control current switch upon finished adjustment of the ram.

The adjusting motor is protected against overload by a protective motor switch, and against short circuits by a three-pole, time-delayed cartridge fuse.

**5.2 4. The Control**

According to its size and type, the machine is equipped with the electric-pneumatic "One-man" two-hand control. For engaging the coupling, the push buttons "Coupling on" must be operated with both hands.

When pressing the push button "Stop" the coupling is disengaged.

On the right front side of the operating desk there is a selector switch with following switch positions: "Adjustment" - "Single Stroke" - "Continuous stroke" - and "Off". The switch "Coupling" for connecting and interrupting the control current is arranged in the switch cabinet. Upon connection of

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**5 OPERATION . CONSTRUCTION**

the control current the signal lamp installed on the selector switch is lighting.

The short-circuit protection is provided by means of a three-pole fuse.

**5.2 5. Operation of the Control with Corresponding Selector Switch Position**

**5.2 5.1 Selector switch position "Adjustment":**

With this connection for the adjustment of tools the ram can be moved by steps, and that upon short operation of the push buttons "Coupling on".

**5.2 5.2 Selector switch position "Single Stroke":  
(see 2.5 2.)**

**5.2 5.3 Selector switch position "Continuous Stroke":  
(see 2.5 3.)**

**5.2 5.4 Selector switch position "Off":**

With this position the coupling cannot be engaged, and an incidental operation of the push buttons "Coupling on" does not entail any movement of the ram.

A special instruction gives informations concerning the electric-pneumatic control.

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**7 GEAR PLANS . SPARE PARTS**

Parts mainly subject to wear:

Pos.:	Designation:	Drawing No.:
1	Lever acting by pressure	80 WN 1103
5	Inside disks	B 80 WN 1110
7	Outside disks	80 WN 1111 181a
4	End disks	B 80 WN 1112
1	Set of friction linings	Multiple disk coupling B 80 WN 1113
140	Tube rivets	5 x 9.5 x 16 DIN 7340
112	Tube rivets	5 x 9.5 x 10 DIN 7340
1	Pull spike	A 5 WN 3402
1	Set spike	B 5
1	Bush	Engagement of air 40 Ø x 36 WN 166
1	Bush	45 Ø x 40 WN 166 181a
1	Set of bearing bushes for press rods	Main press 3 DU 1023
1	Round bush	5 DU 1013
1	Round bush	5 DU 1014 832/11
1	Round bush	5 DU 1015
1	Set of bearing bushes	3 DU 1021
1	Set of bearing bushes	Crank shaft 3 DU 1047
2	Wear rails	4 DU 972
1	Worm shaft	4 PR 1264
1	Bush	Ram adjustment (Main press) A 60 Ø x 95 WN 146
1	Worm rim	3 PR 1262
1	Draw-back ring	3 DU 1115
1	Pressure spindle	4 DU 1101
2	Wear rails	Ram adjustment 4 DU 972
1	Pressure spindle	(Side press) 4 DU 959
2	Cylinder bearings	Flywheel shaft NUJL 120 DIN 5412
1	Self-aligning roller bearing	22320 DIN 635

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## 7 GEAR PLANS - SPARE PARTS

Parts mainly subject to wear:

Pos.:	Designation:	Drawing No.:
1	Lever acting by pressure	80 WN 1103
5	Inside disks	B 80 WN 1110
7	Outside disks	80 WN 1111 181a
4	End disks	B 80 WN 1112
1	Set of friction linings	B 80 WN 1113
	Multiple disk coupling	
140	Tube rivets	5 x 9.5 x 16 DIN 7340
112	Tube rivets	5 x 9.5 x 10 DIN 7340
1	Pull spike	A 5 WN 3402
1	Set spike	B 5
1	Bush	Engagement of air
1	Bush	40 Ø x 36 WN 166 181a
		45 Ø x 40 WN 166
1	Set of bearing bushes for press rods	Main press
		3 DU 1023
1	Round bush	Gearing shaft
1	Round bush	" "
1	Round bush	" "
		5 DU 1013
		5 DU 1014 832/11
		5 DU 1015
1	Set of bearing bushes	Crank shaft
1	Set of bearing bushes	
		3 DU 1021
		3 DU 1047
2	Wear rails	4 DU 972
1	Worm shaft	4 PR 1264
1	Bush	Ram adjustment
1	Worm rim	(Main press)
1	Draw-back ring	A 60 Ø x 95 WN 146
1	Pressure spindle	3 PR 1262
		3 DU 1115
		4 DU 1101
2	Cylinder bearings	Flywheel shaft
1	Self-aligning roller bearing	MUJL 120 DIN 5412
		22320 DIN 635

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## 7 GEAR PLANS - SPARE PARTS

Parts mainly subject to wear:

Pcs.:	Designation:	Type:
1	Grooved bearing	52409 DIN 715
1	Cylinder bearing	NUM 110 DIN 5412
1	Grooved bearing	52224 DIN 715
3	Packing rings	Flywheel shaft 165 WN 5404
1	Packing ring	45 WN 5404
1	Packing ring	Engagement of air 115 WN 5404
1	Packing ring	130 WN 5404
1	Grooved ring sleeve	180x210x15 DIN 6505
1	Grooved ring sleeve	Engagement of air W 240 - 3
1	Round rubber packing	6 Ø x 915 rubber
1	Round rubber packing	Engagement of air 5 Ø x 345 rubber
1	Rubber cord	Ram adjustment 6 Ø x 950 rubber
1	Slammering	Main press 80 x 100 x 13 rubber
3	Springs	Multiple disk coupling 3 WN 30 834/5
2	Springs	Engagement of air 21 WN 30
1	Metal hose	8 Ø x 1000
2	Hose clamps	8 WN 24 without mark
4	V-belts	25x16x3150 DIN 2215
2	Signal lamps for electric installation	220 V, JFA-K 514
3	Fuse cartridges for main drive	80 Amp.
3	Fuse cartridges for control of coupling	15 Amp.

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## 7 GEAR PLANS - SPARE PARTS

Parts mainly subject to wear:

Pcs.:	Designation:	Type:
1	Grooved bearing	52409 DIN 715
1	Cylinder bearing	NUM 110 DIN 5412
1	Grooved bearing	52224 DIN 715
3	Packing rings	Flywheel shaft 165 WN 5404
1	Packing ring	45 WN 5404
1	Packing ring	Engagement of air 115 WN 5404
1	Packing ring	130 WN 5404
1	Grooved ring sleeve	180x210x15 DIN 6505
1	Grooved ring sleeve	Engagement of air 240 - 3
1	Round rubber packing	6 Ø x 315 rubber
1	Round rubber packing	Engagement of air 5 Ø x 345 rubber
1	Rubber cord	Ram adjustment 6 Ø x 950 rubber
1	Simmering	Main press 80 x 100 x 13 rubber
3	Springs	Multiple disk coupling 3 WN 30
2	Springs	Engagement of air 21 WN 30 834/5
1	Metal hose	8 Ø x 1000
2	Hose clamps	8 WN 24 without mark
4	V-belts	25x16x3150 DIN 2215
2	Signal lamps for electric installation	220 V, JFA-K 514
3	Fuse cartridges for main drive	80 Amp.
3	Fuse cartridges for control of coupling	15 Amp.

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**7 GEAR PLANS - SPARE PARTS**

Parts mainly subject to wear:

Pos.:	Designation:	Drawing No.:
1	Grooved bearing	52408 DIN 715
1	Cylinder bearing	NUM 100 DIN 5412
1	Grooved bearing	52220 DIN 715
3	Packing ring for Flywheel shaft	135 WN 5404
1	Packing ring	40 WN 5404
1	Packing ring	95 WN 5404
1	Packing ring	110 WN 5404
1	Grooved ring sleeve	150x180x15 DIN 6505
1	Grooved ring sleeve	200x240x20 DIN 6505
1	Round rubber packing	6 Ø x 240 av.Ø endl.
1	Round rubber packing	5 Ø x 90 av.Ø endl.
1	Round rubber packing	6 Ø x 240 av.Ø endl.
3	Springs for multiple disk coupling	13 WN 30 181a
2	Springs for engagement of air	22 WN 30 832/11
1	Metal hose	800 WN 28
4	V-belts	25x16x2800 DIN 2215
2	Signal lamps for electric equipment 220 V	JPA - K 514
3	Fuse cartridges for main drive	80 Amp.
3	Fuse cartridges for control of coupling	15 Amp.
1	Limit switch with roller	5 E 5752

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**7 GEAR PLANS - SPARE PARTS**

Parts mainly subject to wear:

Pos.:	Designation:	Type:
1	Lever acting by pressure	B 125 WN 1103
5	Inside disks	B 125 WN 1110 (1)
7	Outside disks	125 WN 1111
4	End disks	B 125 WN 1112 (1)
1	Set of friction linings Multiple disk coupling	B 125 WN 1113
140	Tube rivets	5 x 9.5 x 16 DIN 7340
112	Tube rivets	5 x 9.5 x 10 DIN 7340
1	Full spike	A 5 WN 3402
1	Set spike	B 5 WN 3402
1	Bush	450 x 40 WN 166
1	Bush Engagement of air	500 x 45 WN 166 834/
1	Upper bearing bush	3 DU 139/1
1	Lower bearing bush Press rod	3 DU 139/2
1	Joining bush	5 DU 1298
1	Joining bush Gearing shaft	5 DU 1299 834/5
1	Joining bush	5 DU 1300
1	Left upper bearing bush	3 DU 147/1
1	Right lower bearing bush	3 DU 147/1
1	Right upper bearing bush Crank shaft	3 DU 148/1
1	Right lower bearing bush	3 DU 148/2
1	Worm shaft	4 DU 1027
2	Wear rails	4 DU 1262
1	Joining bush Ram adjustment	5 DU 1028 834/5
1	Draw-back ring	3 DU 1221
1	Helical gear wheel	5 DU 1025
1	Pressure spindle	3 DU 23
2	Cylinder bearings	NUJL 140 DIN 5412
1	Self-aligning roller bearing Flywheel shaft	22324 DIN 635

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**7 GEAR PLANS - SPARE PARTS**

Parts mainly subject to wear:

Pos.:	Designation:	Drawing No.:
3	Lever acting by pressure	A 200 WN 1103
5	Inside disks	B 200 WN 1110
7	Outside disks	200 WN 1111
4	End disks	B 200 WN 1112
56	Segments Multiple disk coupling	B 200 WN 1113
140	Tube rivets	6 x 11.5 x 16 DIN7340
112	Tube rivets	6 x 11.5 x 10 DIN7340
1	Full spike	A 6 WN 4302
1	Set spike	B 6 WN 4302
1	Bush	50 Ø x 45 WN 166
1	Bush Engagement of air	55 Ø x 50 WN 166 181a
1	Set of bearing bushes Press rod	3 DU 2141
1	Joining bush	5 DU 2150
1	Joining bush Gearing	5 DB 2149 876/6
1	Joining bush	5 DU 2139
1	Set of bearing bushes	3 DU 2152
1	Set of bearing bushes Crank shaft	3 DU 2151
2	Wear rails	4 DU 2214
2	Wear rails	5 DU 2215
1	Worm shaft	3 DU 1664
2	Bushes Ram adjustment	5 DU 1743 876/6
1	Worm rim	4 DU 1739
1	Draw-back ring	3 DU 1212
1	Pressure spindle	4 DU 2111

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**7 GEAR PLANS - SPARE PARTS**

Parts mainly subject to wear:

Pcs.:	Designation:	Type:
1	Lever acting by pressure	125 WN 1103
5	Inside disks	B 125 WN 1110 (1)
7	Outside disks	125 WN 1111
4	End disks	B 125 WN 1112 (1)
1	Set of friction linings	B 125 WN 1113
140	Tube rivets	5 x 9.5 x 16 DIN 7340
112	Tube rivets	5 x 9.5 x 10 DIN 7340
1	Pull spike	A 5 WN 3402
1	Set spike	B 5 WN 3402
1	Bush	450 x 40 WN 166
1	Bush	500 x 45 WN 166 834/
1	Upper bearing bush	Press rod
1	Lower bearing bush	(Main press)
		3 DU 139/1
		3 DU 139/2
1	Joining bush	Press rod
		(Side press)
		G 1600 x 120 WN 147
		834/5
1	Joining bush	5 DU 1298
1	Joining bush	5 DU 1299 834/5
1	Joining bush	5 DU 1300
1	Left upper bearing bush	3 DU 147/1
1	Right lower bearing bush	3 DU 147/1
1	Right upper bearing bush	3 DU 148/1
1	Right lower bearing bush	3 DU 148/2
1	Worm shaft	4 DU 1027
2	Wear rails	4 DU 1262
1	Joining bush	Ram adjustment
1	Draw-back ring	(Main press)
1	Helical gear wheel	5 DU 1028 834/5
1	Pressure spindle	3 DU 1221
		5 DU 1025
		3 DU 23
2	Wear rails	Ram adjustment
1	Pressure spindle	(Side press)
		4 DU 1268
		4 DU 1212
2	Cylinder bearings	NUJL 140 DIN 5412
1	Self-aligning roller bearing	Flywheel shaft
		22324 DIN 635

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**Working Instruction  
for Straight Sided Crank Presses  
of Type DU 315/800**

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**7 GEAR PLANS - SPARE PARTS**

Parts mainly subject to wear:

Pcs.:	Designation:	Drawing No.:
3	Levers acting by pressure	A 200 WN 1103
5	Inside disks	B 200 WN 1110
7	Outside disks	200 WN 1111
4	End disks	B 200 WN 1112
56	Segments Multiple disk coupling	B 200 WN 1113
140	Tube rivets	6 x 11.5 x 16 DIN 7340
112	Tube rivets	6 x 11.5 x 10 DIN 7340
1	Full spike	A 6 WN 3402
1	Set spike	B 6 WN 4302
1	Bush	500 x 45 WN 166
1	Bush Engagement of air	550 x 50 WN 166 181a
1	Set of bearing bushes Press rod (Main press)	3 DU 2141
1	Joining bush Press rod (Side press)	G 180 Ø x 130 WN 147:R <sub>1</sub> =10 876/6
1	Joining bush	5 DU 2150
1	Joining bush Gearing	5 DU 2149 876/6
1	Joining bush	5 DU 2139
1	Set of bearing bushes	3 DU 2152
1	Set of bearing bushes Crank shaft	3 DU 2151
2	Wear rails	4 DU 2214
2	Wear rails	5 DU 2215
1	Worm shaft	3 DU 1664
2	Bushes Ram adjustment (Main press)	5 DU 1743 876/6
1	Worm rim	4 DU 1739
1	Draw-back ring	3 DU 1212
1	Pressure spindle	4 DU 2111
2	Wear rails	4 DU 2216
1	Pressure spindle Ram adjustment (Side press)	4 DU 2122

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